### THE REPUBLIC OF PANAMA.

Some Exact Information as to the Newest of the Nations of the

By HON, WM. H. BURR, of the Isthmian Canal Commission, In The National Geographic Magazine.

The year on the Isthmus is divided into | May 15, 1889, when the company went the dry season and the wet season. The into bankruptcy, and its effects were put dry season covers the four months of Jan-into the hands of a liquidator, an officer which little or on rain falls. The wet to the American receiver. annual amount usually ranging from about 85 to nearly 155 inches, with an average of about 125 to 130 inches. In the interior, as at Gamboa or Bas Obispo, the annual precipitation varies ordinarily from about 75 to nearly 140 inches, with an average of 90 to 95 inches. The total precipitation at Panama, however, may per annum, with an average of about 66 ties was over 200,000. to 67 inches. As the average annual precipitation in New York or Washington may vary approximately from 40 to 50 inches, it is seen that the wet season in the Republic of Panama exhibits relatively high rainfall, although not more than about one-half of that which occurs at Greytown, in Nicaragua.

THE VARIOUS PROJECTS FOR A SHIP

At the present time the greatest interest centering on the Republic of Panama, aside from the remarkable unanimity with which the people of the Isthmus as a unit declared and secured their independence through a single, effective but bloodless effort, is that which attaches to the proposed ship canal connecting the two oceans practically along the line of the Panama Railroad. The project of an Isthmian ship canal is almost as old as the discovery of the Isthmus, for it is themselves seriously discused this enterprise. As early as 1520 the Spanish monarch, Charles V, directed a survey to be made for the purpose of determining the feasibility of an Isthmian ship canal.

Chagres River

Excavations

an undertaking." The followers of the Spanish Governor were less easily dis-

LATER PROPOSITIONS.

couraged than he.

by New Co.

.....

February, March, and April, during of the French court corresponding closely

Prior to the bankruptcy of the old commonths of the year, the wettest portions pany the project for a sea-level canal being usually in May and in October. The was temporarily abandoned in the hope was temporarily abandoned in the hope rainfall on the Caribbean side-i. c., at that the funds available might be suffi-Colon-is considerably greater than either cient for the construction of a lock canal. in the interior or on the Pacific side, its After various vicissitudes the new Panama Canal Company was organized on the 20th of October, 1894. Work was resumed on the canal immediately thereafter, and has been continued until the present time, the force employed, however, being small. The old company raised by the sale of stocks and bonds not far from \$246,000,000, and it has been stated that vary from about 45 to about 85 inches the number of persons holding the securi-

THE RECOMMENDATIONS OF THE ISTHMIAN

COMMISSION. When the Isthmian Canal Commission made its first visit of investigation of the canal routes four years ago, it found a large amount of excavation and other work done along the line of the canal, in twin plan like the others, each one of as well as a large amount of land, buildings, structures, and many plans and papers, all constituting a part of the propof the new Panama Canal Company. All this property was situated on the Isthmus except a mass of plans and papers in the office of the canal company at Paris. The Commission in its report, under date of Nov. 16, 1901, recommended, in case of selection of the Panama route, payment of \$40,000,000 to the new Panama Canal Company for all its property, rights, and concessions connected constitutes what may be called the Pacific with the unfinished canal. That offer, as made by the United States Government. nearly 400 years ago that the Spaniards has since been accepted by the French company.

Isthmian Canal Commission adopted the French line for its estimates, but made some material changes in the plans for the work. The canal as plan-From that time until this the project of ned by the Commission is a lock canal,

LAKE BOHIO
(Artificial)

AWAWAN CO

Water Levels

over the spillway, the flood waters would flow through an artificial channel down into the Chagres River beyond any of the canal works and where no damage would in casks mounted on wheels and drawn

About 10 miles up the Chagres from Obispo at a point called Alhajuela there is an excellent site for a dam. It has been proposed to build at this Alhajuela or in some other crude and usually unsite a great masonry dam for the pur-pose of impounding flood waters of the Chagres River to the extent of the storage capacity behind the dam, and so reduce the flood effects in Lake Bohio. This storage reservoir would also act as a source of feed water for the canal should the traffic on it in the future become so large as to require this additional sup-

THE CULERRA CUT.

From Obispo, 30 miles from Colon, the canal line runs toward the southeast through the continental divide in a direct ourse toward Panama, and for nearly seven miles from Obispo a great cut has to be made through the high ground forming that divide. For a distance of about five miles from Obispo this is known as the Emperador Cut, beyond which lies the Emperador Cut, beyond which lies ditions, however, are completely remedia a mile and a half known as the Culebra ble by means well known and available Cut. The greatest depth of this cut at Culebra is about 250 feet, and the amount of material to be removed in this stretch of seven miles of canal excavation is about 43,000,000 cubic yards. It is the greatest single feature of the entire canal construc-

and a half miles southeasterly of the Cuis located a flight of two locks arranged water in Lake Bohio. By means of these five miles, and this portion of the canal section or level. The water of this Pacific section of the canal rises and falls coincidently with the tides in the Bay of Panama, and as the range of tide in that

by mules from some more or less polluted source outside of that near the city, or sanitary way.

Panama, constructed immediately under drains at all. The lack of care and prop-er disposal of household and other refuse ways present, and at times assumes epidemic form. Malarial fevers and other similar diseases are also continually present under aggravated forms. These con

at the present time.

The entire Isthmus can be placed in completely sanitary condition so that its come practically standard in the sanitation of cities and towns. It is absolutely es-The summit or Bohio Lake level ends at a point called Pedro Miguel, about one and wholesome water, be established for the cities and larger towns, and concurlebra Cut and 38 miles from Colon, where rently therewith there must be establish ed suitable sewer systems with rational and sanitary disposal of sewage. All these the pair having a lift varying from 27 to results are now perfectly practicable of 31 feet, according to the varying hight of attainment without unreasonable cost or the battle. Before the battle was over the two locks the water surface in the canal is brought down to an elevation about 28 feet above sea level. The last lock on the line is at a ponit called Miraflores, a lit- reasonable sanitary conditions as it is entle less than a mile and a half from the tirely practicable to attain, and with prop-Pedro Miguel locks. From Miraflores to er quarantine regulations, there is no reathe end of the canal, at a point called La Baca on the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than tained entirely from the Bay of Panama is less than the Bay of Panama is le Boca on the Bay of Panama, is less than tained entirely free of yellow fever or from ond day, by a bullet in his shoulder, giving other tropical epidemics.

COST OF THE CANAL.

The United States Government has entered into a provisional agreement to pur chase the entire property of every descripbay is about 20 feet, the Miraflores lock tion and the rights of the new Panama is largely a tidal lock. Its minimum lift, Canal Company for the sum of \$40,000,therefore, at high tide, is 18 feet, while 000. The cost of completing the Panama the maximum lift at low tide is 38 feet. Canal under the plan of the Isthmian It is obvious from these tidal conditions Canai Commission is estimated by that a ship canal across the Isthmus has been actively discussed, although as a restrict of that early survey the Spanish Govarious declared "that such a work was image at the commission is a lock canal, it is obvious from the constructed as a commission at \$144,233,358. The sum of that early survey the Spanish Govarious depth of water of 35 feet, and a top width of 269 feet. This section is

Mean Level

costs as are required to be incurred in se-

United States into much closer communi-

the impetus of her national sanction.

A COMPARISON OF DISTANCES

nearer to Hongkong and Yokohama, to t

he markets of the East, than Hamburg:

From Hamburg to Hongkong.....

New York to Hongkong.....

Isthmus and begin the work.

PERSONAL.

Maj. Hoyt Sherman, a younger brother of the General and the Senator, died at his home in Des Moines, Iowa, Jan. 25. He was born in 1827, became a printer's apprentice, went to Iowa in 1848, entered the practice of the law and was appointed by President Zachary Taylor Postmaster of Des Moines. He was consequently one of There are a few drains in the city of the pioneers of Iowa.

the climate makes them far worse than no of the Committee on Military Affairs. He was a Democrat, but when a resolution was introduced to raise half a million dolcreates the most ansanitary conditions imaginable. These observations may be emphasized for the smaller towns and villages between Colon and Panama. As a consequence, yellow fever is probably always present and at the probably always are always and at the probably always always always always and at the probably always always and brought his regiment to the Army of the Potomac, and behaved with conspicuous gallantry at Cedar Creek. He was much beloved by his men for his personal gallantly and his insistent, thoughtful care of eral, and mustered out Aug. 24, 1865. One of Massachusetts' modest war heroes died at Brockton, Mass., Feb. 3, at the age healthfulness shall be assured by resorting to methods and means which have now beson has a war record that is written in

pigment upon canvas. His picture and his deed, told by the brush, without words, hangs in City Hall in the city of his resi dence. At Gettysburg on the first day, when the bearer of the Stars and Stripes was shot, Corporal Jackson caught the colors before they fell, while they were falling, and carried the National Flag through material difficulty. It will be imperative, bearer of the State flag was wounded, and given the Stars and Stripes to carry till his term was out, in 1864. This rescue of the him pain all his life. At Chancellorsville, being alone, he encountered a rebel Lieutenant and two privates, and by nerve and dexterity compelled their surrender. When Mr. McKinley was reelected President Comrade Jackson was the messenger to Washington for the Massachusetts Electoral College. He was very prominent in Albert R. Wickham, 2d Ohio, Beaver-

ton, Mich., was captured at Chickamauga and kept a prisoner 15 months and 10 days, eight months of which time was spent in Andersonville. He says that if the Government ever intends to do anything for that unfortunate class, it is high time. Will Congress wait until the last veteran has died? They are about dis-

The Meriden (Conn.) Record says that John R. Doran, now living in Meriden. is, as far as is known, the sole survivor of the garrison of Fort Sumter at the time that it was bombarded. He was, born in Ireland, but had been in this country for some time, and went to Charleston, S. C., not want to fight for the Southern Confederacy, he had better enlist in the Reg-ular Army, which he did, entering Bat-

be the entertainment by Joseph B. Green-hnt, President of the great Siegel-Cooper The staff is made from teak wood taken Lake, Utah. Co., New York, of Emil Frye, ex-President of the Swiss Republic. Comrade Greenhut was born in Austria, but plate is from a brass belt plate, from the brought to this country when nine years old, and at the age of 18 enlisted in the 1876, in which war Capt. Ryan was a par-12th III. He was discharged on account of wounds received at Fort Donelson, but sions necessary to enable the United upon recovering from these raised a com-States Government to enter upon the pany for the 82d Ill. and became its Captain. The Captain of another company being turned out at the Concord Reform-The consummation of this great work in the regiment was Emil Frye, a young atory, the metal being molded at the Walson Papallic of Papallic bar Related by Swiss, who came from the famous fight of the Republic of Panama has solved ing stock of his country. They were both bridge foundry. The weight of the cane the difficulties which had gathered about enthusiastic young Americans as well as is three pounds. Capt Ryan served three building of the railroad between Bohio and ried to completion. This achievement will prisoner at Gettysburg, and held by the not only create new lines of ocean com- rebels for eight months. His health was merce and stimulate some of the older lines into new life, but it will also bring to Switzerland to recuperate, but The Annual Encampment of the lines into new life, but it will also bring to Switzerland to recuperate, but The Annual Encampment of the lines into new life, but it will also bring to Switzerland to recuperate, but the life and relices from the different wars. the Atlantic and Pacific shores of the still had firm intentions to return to this country, making it his home, and join ca-

cation than before, thus strengthening reers with Capt. Greenhut. Upon reachsympathy which lie at the foundation of campaign in progress with three evenlybest national life. In this part of the world's development the new Republic of suddenly agreed upon by which the young Panama becomes the center of the material activities through which these great courage and soldiership, should be taken results will be accomplished, thus attain- up instead of one of the three compaing the fruition of 400 years of effort. She triots, and he was elected Secretary of opening the way to the attainment of this of his term of two years he would return world improvement and giving the work to America and join him. He was so of honor. Several years ago he was sent The following table shows that the Pa to this country as Minister, and upon his nama Canal will bring New York much return to Switzerland was elected to the Council, and in 1894 was chosen President. He was thus never able to carry

1,820 11.655 9,835 12.531 13,024 3,729 13,464 9,835 13,198 10,427 12,367 2,863 ...... 6,652 9,541 ......

ica his home. Capt. Greenhut went into

business, had great successes and corre-

sponding reverses, but at last got definitely

on top, acquired a fortune, and in 1896

Hamburg to San Francisco..... New York to San Francisco..... Whose Pictures?

Hamburg to Yokohama..... New York to Yokohama..... Hamburg to Melbourne..... 13.802 New York to Melbourne..... 13,502 15,140 14,840 (The End.) out his earlier intention of making Amer-

From John W. Abbott, Fort Scott, Kan., The National Tribune receives three photographs and this account of them: "These pictures I have had since September, 1864, while nursing in the hospital which he eventually became President. at Richmond. A man, whose name I Capt. Frye will visit this country next forget, died there. There were no papers Fall to attend the St. Louis Exposition

be glad to get them." war, no doubt. The second is a woman— lillinois when a boy, and enlisted in the that period, with broad stripes, light and Adjutant. When his superior officers were



forget, died there. There were no papers and will be the guest, during his stay, in his pockets; but I found these photos. of his old chum, Capt. Greenhut. Perhaps you can find some one who would Col. Abraham H. Ryan, of East Orange J., was stricken with heart disease One of the pictures is a photograph of while on a train coming home, and died Horace Greely taken in the days of the before reaching the town. Col. Ryan was 17th Ill., of which regiment he became In 999 cases out of every thousand, the dark alternating, around the skirt. She shot down at Shilot, he commanded the brigade for several hours until the close of the battle, for which he received promocommanded it until the close of the war. He went into business in Little Rock, Ark., and became a banker and railroad president. He retired from business some years ago and came East to live, interesting himself in various educational and social enterprises, as he was a lover of art and music. He was one of the leading citizens of East Orange, and his funeral was largely attended. Comrade Stephen M. Long, Commander of the Department of New Jersey, G. A. R., attended with a guard of honor, composed of Comrades Josiah B. McCoy, Joel W.

the press of Ohio and Missouri in editorial capacities, in Cleveland, Ohio, and St. Joseph, Mo., and in Kansas City. For many years he published the Lake County Advertiser at Painesville, O. Later he

became Pension Agent.

Norton McGriffin, of Washington, Pa.,
is the only resident of that County who served in the Mexican War, and he is a veteran of both the Mexican and civil wars. He served in the former in the the surface of the streets, with little or no regard to grades. The water or sewage and decaying matter collecting in the low portions of these drains and remaining there under the high temperature of the climate water or Sumter, and a member of the firing on Fort Sumter, and a member of the Committee on Military Affairs. He served in the former in the ranks of the Duquesne Grays, the 1st Pa., and in April, 1861, took from Washington County the first company from that County to respond to the call for three months' volunteers. He was commissioned by Gov. Curtin Lieutenant-Colonel of the 12th Pa., and when the call for three-year men was made he was commissioned Lieutenant-Colonel of the 85th Pa. Loss of health compelled his retirement before the war ended. He has served the County by administering some of its most responsible offices and as a member of the Legislature. He has also been twice U. S. Consul for Canada ports. He was 80 years old on Jan. 23, on which occasion W. F. Teupleton Post, 120, of Washington, Pa., prepared to entertain them. He was promoted to Brigadier-Gen- him with honors and ceremonies and presented him a Morris chair; but he was not present to receive the one or enjoy the other, being at the bedside of his wife, who died that day, after a companionship of 44

> W. T. Albers, who died at Sheboygan, Mich., on Jan. 21, of hemorrhage of the heart, was an active citizen and a loyal comrade. Born May 22, 1840, in the Palatinate, Germany, he emigrated to America in 1860. He enlisted as First Lieutenant, 35th Iowa, and was promoted to a Captaincy. Capt. Albers was wounded at Pleasant Hills, La. He located in Wisconsin in 1874 at Cleveland, where for 24 years he was Justice of the Peace. was a member of the Legislature in 1883 and 1884. A Democrat till 1892, when he took the platform for the Republicans, fighting free trade and free silver. Nov. 10, 1900, he was appointed Deputy Internal Collector. He was a member of the G. A. R. and Loyal Legion.

The New York Department, Daughters of Veterans, feel that they have sustained a heavy loss in the death of Sister Mary Wethernox, of Oneonta. Her many noble qualities and her beautiful Christian character endeared her to all who knew her. She was an earnest, zealous worker in our Order, which she faithfully served in several Department offices, as well as in Celia Westcott Tent. She will be greatly missed from the Tent meetings and social gatherings. The sisters throughout the State, especially those who knew her best, sympathize with the family in their bereavement.

A bill before Congress provides for giving a Medal of Honor to Roe Reisinger, of Franklin, Pa., Color Corporal of the 150th Pa. The medal proposed is for conspicuous gallantry at Gettysburg, where the Congress was wounded and the colors were Corporal was wounded and the colors were captured. The Greenville (Pa.) Progress attacks Corp'l Reisinger's title to the medal, and alleges that he did not carry in Ireland, but had been in this country for some time, and went to Charleston, S. C., in 1860 in search of a job. He was then 20 years old. A friend of his on the police force advised him that if he did off the field. Capt. John Ryan, of Newton, Mass., has

a museum of war souvenirs. He is a vet-

tery H. 1st U. S. Art. He was in the fort is a cane which is unique. Its materials from the time of its occupation until its represent four of the wars in which the now President of the Church, officiating, surrender, and afterward fought through the entire war, serving altogether 11 years made from the hilt of a cavalry saber picked years old; have lived here to raise a family in the Regular Army. He is now getting a pension of \$6 a month in his old age, but an effort is being made to secure an battlefield of Fredericksburg, and the hilt of a saher bayonet nicked up on the field when the field of a saher bayonet nicked up on the field of a saher bayonet nicked up on the field of a saher bayonet nicked up on the field of a saher bayonet nicked up on the field of a saher bayonet nicked up on the field of a saher bayonet nicked up on the field of a saher bayonet nicked up on the field of a saher bayonet nicked up on the field of a saher bayonet nicked up on the field of the person who takes it and lives up to it. I love my country better of Petersburg, thus representing the three Custer battlefield during the Sioux War of ticipant. The tip is made from a pair of dragoon spurs from the battlefield of Buena Vista, Mexican War. The cane was made under the Captain's supervision, the staff on the plains and in the Southern States.

He is in possession of about 800 souvenirs The Annual Encampment of the Department of New York, G. A. R., will be held at Rochester, June 14, 15, 16. The candithose bonds of mutual interest and natural ing Basel, however, there was a political Henry N. Burhans, of Syracuse, and James M. Snyder, of Troy. Col. Burhans has received many assurances of support in the western part of the State. He entered the army in 1862 as First Lieutenant in the 149th N. Y. and was mustered out at the close of the war as Lieutenant-Colonel and is to be congratulated in marking her en- the Canton. He accepted the office, but on the staff of Gen. Geary and Provostbrevet Colonel. He was Judge-Advocate trance among the nations of the earth by wrote to Capt. Greenhut that at the end Marshal of Savannah. He is a very successful business man, and is now Presisatisfactory as Secretary, however, that his compatriots elected him to other offices iron concerns in New York. He is Pastdent of the Burhans & Black Company of Commander of Root Post, No. 131, Past-President of the Onondaga Veteran Association, and one of the Trustees of the State Soldiers and Sailors' Home at Bath,

Gen. R. H. Warfield has been for many years the successful manager of the California Hotel at San Francisco. The owners of the block and the hotel have been raising the rent on Gen. Warfield, and finally reached a point at which he refused his book—Have You Brains? It is sent to go any further. He had been paying free. Thousands and thousands of pen-\$1,350 per mouth, and the owners demand-sions can now be increased. All letters ed \$1,750, when he offered to compromise at \$1,500 a month. This was rejected, and Gen. Warfield gave notice that he would retire April 1, the difficulty of getting a long lease being also in the way. What Gen. Warfield's future plans may be have not yet developed, but he is too good a man, to remain idle very long.

The Army of the Potomac.

Edward Fisher, Co. T, 130th Pa., Commander Post 456, G. A. R., Milroy, Ind., writes: "I am the only member of our Post who was in the Army of the Poto- Patents procured. No allowance, no mac. It is with keen pleasure that I read the history of that great army, now appearing in The National Tribune. History can furnish no other to equal the sacrifices. devotion and loyalty made and exhibited by the men of the Army of the Potomac It was the Nation's stand-by, and finally wore out the persistent, plucky, determined Lee. But the people never really appreciated what it did and what it endured. tion to Captain. He served as Chief of Those who now read Swinton's History Staff for Gen. Ross, and afterward was may begin to give credit to that muchon the staff of Gen. Steele. In 1864 he abused Army—and not say: 'All quiet became Colonel of the 3d Ark. Cav., and along the Potomac.'"

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Dr. Marshal Beaty, the Nose, Throat and Lan Specialist, of Cincinnati, recently complet series of trial treatments of his Antiseptic Medicated Air Cure on one hundred patients; some were consumptives in the lowest emaciated stages, others of a catarrhal, asthmatic and bron-chial nature. The record of each patient kept by the Doctor as the home treatment progres was very interesting. The most remarkable and gratifying features in connection with the treatment was the rapid healing of the cavities and tubercles of the lungs and the raw, ulcerated surface of the mucous membrane of the entire breathing organs. This is phenomenal, and ample proof that this great discovery has solved the problem of a permanent cure for the thousands of sufferers from all catarrhal, bronchial and lung troubles. In his account of it, the Doctor says: "No germ of Catarrh, Asthma, Bronchitis or Consumption can live under the action of this powerful autiseptic. When taken internally and breathed and inhaled into the air passages, bronchial tubes and cells of the lungs, the germs are at once destroyed and expelled from the system, and the disease is



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A Witness Against Smoot.

EDITOR NATIONAL TRIBUNE: I saw The National Tribune of Nov. 18 a statement made by Senator Smoot, wherein he stated that the oath taken in the endowment house did not disqualify him from eran of two wars. Among the souvenirs holding his seat in Congress. I was marserve both, so I withslrew, and wish to deny his statement.-M. D. Cook, Salt

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## **PENSIONS**

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in a southwesterly direction. The surveys of the Isthmian Canal Commission showed that the elevation of the divide at this point and the heavy work to be done along its line were far too great to per-mit its feasibility being considered in comparison with that of the Panama route. The San Blas route, the Caribbean end of which is on the Gulf of San Blas, is about 60 miles east of Colon. This route has the distinguishing characteristic of

being located on probably the shortest line between the tide waters of the two oceans on the Isthmus, this distance being scarcely 30 miles. The short length of this line has secured for it a number of earnest advocates. It also was subject to survey by the engineering parties of the Isthmian Commission. The elevation of the divide at this crossing is so great as to necessitate the consideration of a ship tunnel from five to seven miles long, the canal being planned as a sea-level waterway. The great cost of a canal on this line and the hazards attending such a construction as a ship tunnel rendered this route, like the Caledonia line, neither practicable nor feasible, compared with the Panama route.

Many surveys and examinations have been made at different crossing of the Central American isthmus between Tehuantepec, in Mexico, and the eastern limit of the Republic of Panama. As earnest and as enthusiastic as the supporters of other routes have been, the most complete and exact surveys and estimates have shown that the Panama route embodies the greatest number of advantages of any line ever considered for a ship canal between the two oceans. It is a tribute to the sagacity and good judgment of the old Spanish explorers that they also settled upon practically this route as the most feasible and practicable for the same pur-

The proposed Panama line, favorably reported upon by the Isthmian Canal Commission and now adopted as the basis of the treaty being negotiated between the United States and the Republic of Panama, begins at Colon and extends in a southeasterly direction to a point on the Bay of Panama near the city of that name, and has a total length of 49.07 miles between the six-fathom curves in the two oceans. At the present time the city of Colon has a population of probably about 3,000 people, while the city of Panama has a population of perhaps 25,000 people. The population scattered along the line of the railroad may add 10,000 to 15,line of the railroad may add 10,000 to 15,000 more, making a total of perhaps 40,but the surplus of flood waters of the
Chagres River would be discharged over
mother or sister gives him a spoon and
mother or sister gives him a spoon and of territory between the two oceans withwhich the railroad is found and the canal will be built.

WAP OF THE PANAMA CANAL, WITH PROFILE VIEW OF THE EXCAVATIONS MADE BY THE OLD AND NEW PRENCH COMPANIES, AND TO BE MADE BY THE UNITED STATES. practicable, and that no king, however suitably modified for harbor sections, for the Bay of Panama is located closely which should be added such additional powerful he might be, was capable of sections in soft ground, for sections in along the course of the Rio Grande, which costs as are required to be incurred in sections a junction of the two seas or of rock and in lakes and wherever required is mainly a tidal river, its two principal curing the additional rights and concess furnishing the means of carrying out such by unusual conditions. These adopted tributaries above Miraflores being Rio sections would afford ample waterway for Pedro Miguel and Rio Caimitillo, both bethe greatest ships afloat at the present ing small and insignificant streams. time, as required by the law creating the

The locks for this canal are great ma-The ship-canal enterprise gathered adsonry constructions, having a usable vocates from one century to another, until, during the 19th century and the first

years of the 20th, many careful surveys of possible routes across the Isthmus were made. The principal of those lying in the Republic of Panama, beginning with the most easterly, are the Caledonia route, the harbor of Colon, the canal is planned Obispo, to be excavated for a distance of seven ground. the San Bias route, and the Panama route. miles through the low, marshy grounds in The Caledonia route has at times attracted much attention on account of the highly colored but absolutely false accounts rendered of it by one or two early explorers. The northern extremity of this route, at Caledonia Bay, is about 165 miles east of Colon and crosses the Isthmus in the main with rock outcropings on one side and Isthmian Canal Commission provisionally and without it or its equiavlent the canai located its dam at a site nearly half a mile downstream from that of the French

dam, and proposes to build it materially higher.

THE GREAT DAM AT BOHIO. This dam would retain behind it the waters of the Chagres River at an eleva-tion varying from 85 feet to 90 or 92 feet above mean sea level, thus forming what has been called Lake Bohio. It would back up the water of the Chagres River for a distance of about 20 miles, through about 14 of which the course of the canal would be laid. Lake Bohio would constitute the summit level of the canal, and would be reached by two great masonry locks built together, i. e., in series near one end of the dam at Bohio, the lift of each one of these two locks being 45 feet as a maximum. These locks would be built as twin structures, so that if an accident should happen to one side the other side would still be available for use, and thus save the operation of the canal from being broken. A great ledge of the rock affords an excellent site for the construction of these locks. The building of this great dam at Bo-

hio, with its top nearly 100 feet above the water in the river in its normal condition, is one of the great works of the entire canal construction. As the safety and operation of the canal would depend entirely upon the stability of this dam, the Commission recommended a plan of construction by which a masonry core wall 30 feet thick at the bottom and eight feet at the top would be built up from the rock beneath the bed of the river to the rock beneath the rock beneath the bed of the river to the rock beneath the

bed are composed.

the highest water in Lake Bohio would easy to forget. be eight feet lower than that elevation, If the remedy is in liquid form, the of masonry and about 2,000 rect iong. Its canal route is that which was adopted at the International Scientific Congress convened in Paris in May, 1879, under the anspices of Ferdinand de Lessimated that with the gratest flood peep soin in the estimated that with the gratest flood peep soin in the constructed should be a scalevel. It is constructed should be a scalevel canal. A company entitled "Company may be constructed should be a scalevel canal. A company entitled "Company was immediately organical Company, was immediately organical Company, was immediately organical Conpany, was immediately organized to construct the work. After various efforts it financed the enterprise and constructed the work. After various efforts it financed the enterprise and began work, which was prosecuted until requires no effective for the canal canal company was prosecuted until requires no effect of this proposed before the canal canal company was prosecuted until requires no effect of the canal canal company was prosecuted until requires no effect of the canal canal company was prosecuted until requires no effect of the canal canal company was prosecuted until requires no effect of the canal canal company was prosecuted until requires no effect of the canal canal company was immediately organized to construct the work. After various efforts it financed the enterprise and constructed should be a cacal evel with the canal canal company was immediately organized to construct the work. After various efforts it financed the enterprise and constructed should be a cacal evel with the canal canal company was immediately organized to construct the work. After various efforts it financed the enterprise and constructed should be a cacal evel with the canal canal company was immediately organized to construct the work. After various efforts it financed the enterprise and constructed should be a cacal evel with the canal canal company was immediately organized to construct the work. After various efforts it financed the enterprise and cons

THE LENGTH OF CANAL between the shore lines is about 44 miles, although the length between the sixfathom curves on the two sides of the length of 740 feet with a clear width of 18thmus, as has already been stated, is 84 feet, more than large enough to accommodate any vessel now affoat or plandard to be built necessitate the relocation and revenue. The commodate any vessel now affoat or plandard necessitate the relocation and revenue. The commodate any vessel now affoat or plandard necessitate the relocation and revenue. The commodate and length of 740 feet with a clear width of Isthmus, as has already been stated, is and it will probably be but a glood soldiers, and became fast friends. throwing it back upon higher

No canal with locks can be operated that vicinity to Gatun, where the line without provision for the water used in meets the Chagres River. From that taking boats through the locks, for evapopoint to Bohio, about 17 miles from Colon, ration, for seepage, and for other purposes a little east of south from the point of incident to maintenance and operation of starting, the canal would be excavated the canal. At each lockage on the Pangenerally along the marshy lowlands ama canal a lock full of water, representthrough which the Chagres River flows in that vicinity, cutting the course of that wide, and 45 feet deep, would be used in river four or five times. This 17-mile sec- the Bohio locks and about two-thirds as tion of the canal is a sea-level section, but much in the Pedro Miguel locks. This reat Bohio is found a comparatively narrow quires a large supply of water, which the place in the valley of the Chagres River Isthmian Commission computed for all purposes to be 1,070 cubic feet per second at which a dam may be built. At this for an annual traffic of 10,000,000 tons point it was the purpose of the French company also to build a dam, but the supply is afforded by the Chagres River. supply is afforded by the Chagres River,

> would not be possible. THE CHAGRES FLOODS.

In view of the complete system of selfcontrol of the Chagres floods by the Gigante Spillway, the Chagres River, instead of being an insurmountable obstacle to the construction and maintenance of the canal, as has at times been apprehended. is actually a gracious feature of the canal environment, and by that automatic control it has been changed from a sinister agent to a friendly power. Furthermore, while the average discharge of the Chagres River is nearly three times the quantity required for feeding the canal, there are times in the dry seasons when the discharge of the river is not more than two-thirds of the quantity required for that purpose. This deficiency is abundantly made up by the storage in Lake Bohio until the traffic exceeds 10,000,000 tons annually. At that time the storage in the Alhajuela Reservoir will give an additional supply for an increase of traffic three or four times as great as the volume which can be accommodated by the storage in Lake Bohio.

ABOMINABLE SANITARY CONDITIONS. The sanitary conditions of the Isthmus are at the present time wretchedly bad. Neither Colon nor Panama has either a

So Easy to Forget. the top of the dam, thus efficiently pre- day, either before or after meals, and on venting all leakage of water through the porous sand and gravel, of which large portions of the substrata beneath the river succeed pretty well at first, but soon As the top of this dam would have an you'll begin to skip doses, then the medielevation of 100 feet above the sea, and as cine fails in its intended effect. It's so

no water would ever overflow this dam, business man loses a dose in the middle chagres River would be discharged over a masonry spillway about three miles from the dam. The spillway weir would be of masonry and about 2,000 feet long. Its medicine is in tablet form, the chances medicine is in tablet form, the chances location is in a notch or depression in the are he will never think of it until he